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# (12) United States Patent Del Fabro

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# (54) BENDING MACHINE FOR METAL PRODUCTS AND CORRESPONDING BENDING METHOD

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(58) Field of Classification Search

### (56) References Cited

#### U.S. PATENT DOCUMENTS

#### FOREIGN PATENT DOCUMENTS

EP	1396296 A1	3/2004
WO	WO-03/024640 A1	3/2003
WO	WO-2007/141273 A1	12/2007
WO	WO-2012/143776 A1	10/2012

# OTHER PUBLICATIONS

Search Report and Written Opinion for PCT/IB2013/002694, mailed Apr. 4, 2014.

\* cited by examiner

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# (57) ABSTRACT

Bending machine for one or more metal products such as, for example, bars (11a, 11b), reinforcement round pieces, structural shapes, tubes or other profiles, comprising at least a bending unit, a main drawing unit, able to draw the bar along an axis of advance toward the bending unit, and a main shearing unit disposed between the bending unit and the main drawing unit. The machine also comprises a secondary drawing or extraction unit disposed between the main drawing unit and the main shearing unit. The secondary drawing or extraction unit is configured and programmed to draw an end portion of bar, exiting from the main drawing unit, along the axis of advance toward the bending unit.

# 8 Claims, 4 Drawing Sheets

